HARTCROWSER

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
Fax 206.328.5581
Tel 206.324.9530

Earth and Environmental Technologies
J-2296-05

November 4, 1994

Mr. Gregory A. Rapp
Construction Services Manager
Potlatch Corporation
1100 Railroad Avenue
P.O. Box 386
St. Maries, Idaho 83861

Re: Laboratory Results for Excavated Soils
Avery Landing Recovery System

Dear Mr. Rapp:

This letter presents the laboratory analytical results for samples of soil excavated during construction of the recovery system at the Avery Landing site. Sampling and analysis were conducted based on the Remediation Plan (Exhibit B of the Consent Order), as agreed to by John Sutherland and Brian Painter of the Idaho Division of Environmental Quality (IDEQ) at the pre-construction meeting on August 10, 1994.

The sampling and analysis of excess excavated soil were conducted as follows:

- Soil samples were collected at a rate of one per 100 cubic yards. A total of 16 samples (SP-1 through SP-16) were collected although soils represented by six of the samples (SP-1 through SP-6) were subsequently used as backfill. Approximately 1,000 cubic yards of soil remain stockpiled at the site, represented by samples SP-7 through SP-16. The approximate sampling locations on the soil stockpile are shown on Figure 1.

- The 16 samples were analyzed for Total Petroleum Hydrocarbons (TPH) by Method 418.1, by Laucks Testing Laboratories, Inc., of Seattle, Washington. The TPH results are presented in Attachment A.

- The soil sample having the highest TPH concentration (SP-13) was analyzed for total concentrations of the eight RCRA TCLP metals, PCBs by Method SW8080, and base

whose decision was this?

neutral and acid extractable organics (BNAs) by Method SW8270. These results are presented in Attachment B.

The analytical results show that metals and PCBs were not detected at elevated concentrations. Although the highest TPH concentration was 3,400 mg/kg, the polynuclear aromatic hydrocarbon (PAH) compounds in this sample were below 1 mg/kg. Based on the primary source of contaminants at the site (bunker C/heavy-end petroleum hydrocarbons), this relatively low PAH concentration indicates that the stockpiled soils do not represent grossly contaminated soils from the site. Based on these results, the stockpiled soils do not constitute a hazardous waste.

The remediation plan for the site requires that soil not constituting a hazardous waste but containing over 1,000 mg/kg TPH be landfarmed onsite. TPH results for soil currently stockpiled range from 250 to 3,400 mg/kg, with 8 of 10 samples exceeding 1,000 mg/kg. The average TPH concentration is 1,695 mg/kg.

We recommend that Potlatch and IDEQ consider landspreading rather than landfarming of the stockpiled soil, based on the following reasons:

- Landspreading is a passive remediation method which decreases petroleum hydrocarbon concentrations in soil through biological action and aeration. Landspreading should be able to attain the 1,000 mg/kg TPH criteria within one to two years. While a work plan and follow-up monitoring would still be required for landspreading, the additional effort of lining, tilling, and fertilization typically required for landfarming would be eliminated.

- The stockpiled soils are representative of existing surficial soils at the site since they have been excavated from the shallow portions of the recovery trenches. Placement back on the site should therefore not result in additional impact to the site.

Whichever remediation method is selected, activities will be scheduled for next spring because of weather conditions. A liner will be placed over the stockpiled soil to secure it for the winter.

Work for this project was performed, and this letter prepared, in accordance with generally accepted professional practices for the nature and conditions of the work completed in the same or similar location, at the time the work was performed. It is intended for the exclusive use of the Potlatch Corporation for specific application to the referenced property.

If additional information or clarification is required, please call Barry Kellems at (206) 324-9530.

Sincerely,

HART CROWSER, INC.

Barry Kellems

BARRY L. KELLEMS, P.E.
Associate Engineer

BK:bjg
Labdata.ltr

Attachments:

Figure 1 Sampling Location Plan

A - Certificates of Analysis, October 12, 1994
Laucks Testing Laboratories, Inc.

B - Certificates of Analysis, October 28, 1994
Laucks Testing Laboratories, Inc.

HARTCROWSER

Page 1 of 1

Job No. J-2296-05

Project Avery Landing Site

Date 11/2/94

Calculations for Sampling Location Plan

Made by

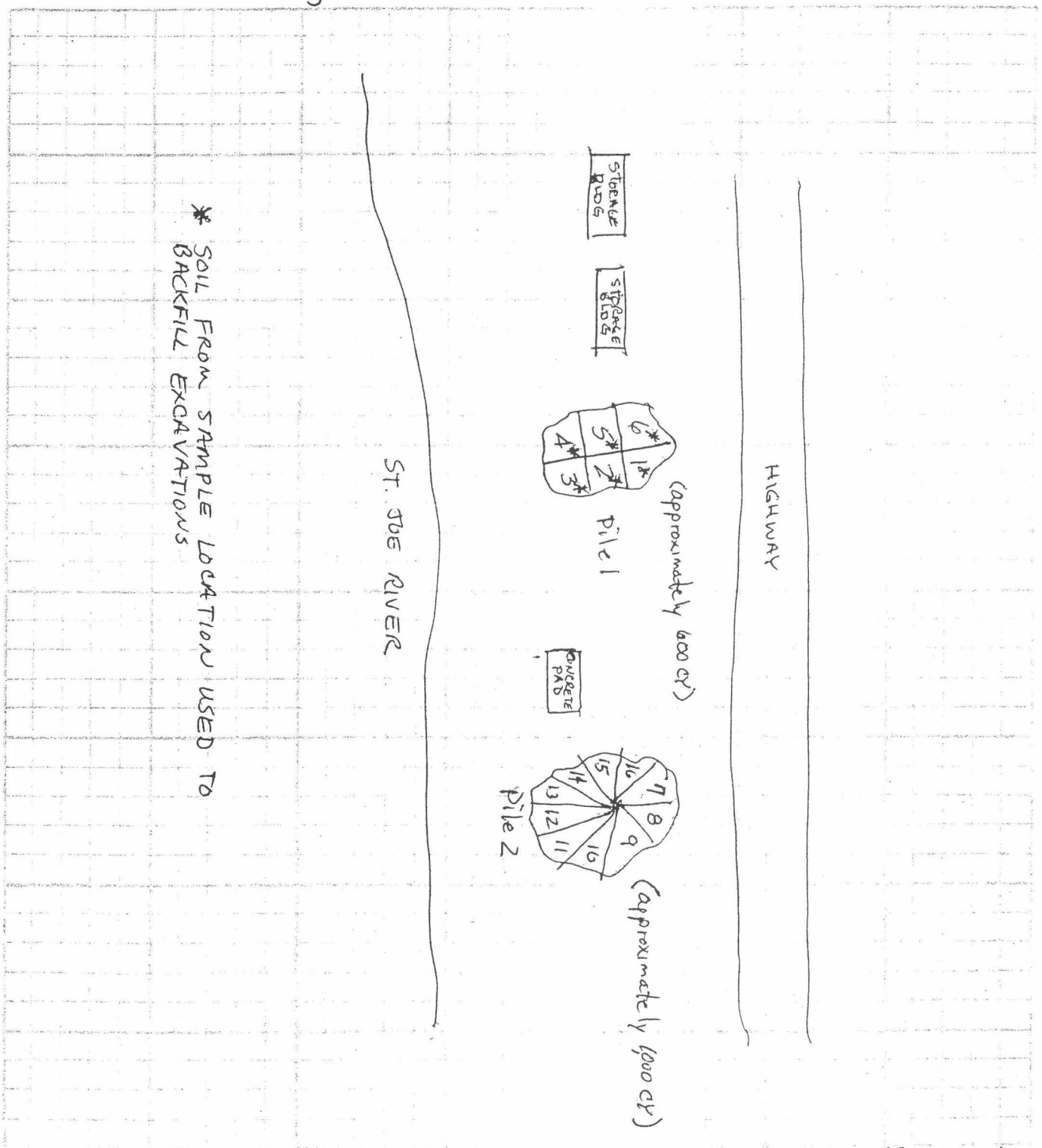

Figure 1

Hart Crowser
J-2296-05

ATTACHMENT A
CERTIFICATES OF ANALYSIS, OCTOBER 12, 1994
LAUCKS TESTING LABORATORIES, INC.

Laucks Since 1908
Testing Laboratories, Inc.
940 South Harney St., Seattle, WA 98108 (206) 767-5060 FAX (206) 767-5063

Chemistry, Microbiology, and Technical Services

CLIENT: Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, WA 98102

ATTN : Barry Kellems

Certificate of Analysis

Work Order# : 94-10-086
DATE RECEIVED : 10/03/94
DATE OF REPORT: 10/12/94
CLIENT JOB ID : Job No. J-2296-05

Work ID : Potlatch - Avery Landing
Taken By : Client
Transported by: Hand Delivered
Type : Soil

SAMPLE IDENTIFICATION:

	Sample Description	Collection Date		Sample Description	Collection Date
01	SP-1	09/30/94	09	SP-9	09/30/94
02	SP-2	09/30/94	10	SP-10	09/30/94
03	SP-3	09/30/94	11	SP-11	09/30/94
04	SP-4	09/30/94	12	SP-12	09/30/94
05	SP-5	09/30/94	13	SP-13	09/30/94
06	SP-6	09/30/94	14	SP-14	09/30/94
07	SP-7	09/30/94	15	SP-15	09/30/94
08	SP-8	09/30/94	16	SP-16	09/30/94

FLAGGING:

The flag "U" indicates the analyte of interest was not detected, to the limit of detection indicated.

ATTACHMENTS:

Following presentation of sample results, the following appendices are attached to this report:

Appendix A: Method Blank Report
Appendix B: MS/Dup and Duplicate Report
Appendix C: Chain-of-Custody

Laucks Since 1908
Testing Laboratories, Inc.
940 South Harney St., Seattle, WA 98108 (206) 767-5060 FAX (206) 767-5063
Chemistry, Microbiology, and Technical Services

CLIENT : Hart Crowser, Inc.

Certificate of Analysis

Work Order# : 94-10-086

Unless otherwise instructed all samples will be discarded on 11/20/94

Respectfully submitted,
Laucks Testing Laboratories, Inc.

J. M. Owens

Laucks Since 1908
Testing Laboratories, Inc.
940 South Harney St., Seattle, WA 98108 (206) 767-5060 FAX (206) 767-5063
Chemistry, Microbiology, and Technical Services

CLIENT : Hart Crowser, Inc.

Certificate of Analysis

Work Order # 94-10-086

TESTS PERFORMED AND RESULTS:

Analyte	Units	01	02	03	04
Total Solids	%	93.2	91.4	77.9	96.2
WTPH-418.1	mg/kg DB	770.	730.	870.	860.

Analyte	Units	05	06	07	08
Total Solids	%	93.5	91.2	91.0	86.8
WTPH-418.1	mg/kg DB	490.	680.	1900.	1300.

Analyte	Units	09	10	11	12
Total Solids	%	89.7	92.4	93.1	91.6
WTPH-418.1	mg/kg DB	1200.	250.	500.	2300.

Analyte	Units	13	14	15	16
Total Solids	%	90.7	92.4	90.0	90.0
WTPH-418.1	mg/kg DB	3400.	1900.	2300.	1900.

Laucks Since 1908
Testing Laboratories, Inc.
940 South Harney St., Seattle, WA 98108 (206) 767-5060 FAX (206) 767-5063
Chemistry, Microbiology, and Technical Services

APPENDIX A

Method Blank Report

Laucks Since 1908
Testing Laboratories, Inc.
940 South Harney St., Seattle, WA 98108 (206) 767-5060 FAX (206) 767-5063
Chemistry, Microbiology, and Technical Services

Quality Control Report
Method Blanks for Work Order 9410086

Blank Name	Samples Verified	Test Description	Result	Units	Control Limit
B100694_OG_S01	1-8	WTPH 418.1	20 U	mg/kg DB	40
B100694_OG_S02	9-16	WTPH 418.1	20 U	mg/kg DB	40

A method blank can validate more than one analyte on more than one work order. The method blanks in this report may validate analytes not determined on this work order, but nonetheless determined in the associated blank.

Because they validate more than one work order, method blank results are not always reported in the same concentration units or to the same detection limits that are used for sample results.

* = blank exceeds control limit

Laucks Since 1908
Testing Laboratories, Inc.
940 South Harney St., Seattle, WA 98108 (206) 767-5060 FAX (206) 767-5063
Chemistry, Microbiology, and Technical Services

APPENDIX B

MS/Dup and Duplicate Report

Laucks Since 1908
Testing Laboratories, Inc.
940 South Harney St., Seattle, WA 98108 (206) 767-5060 FAX (206) 767-5063
Chemistry, Microbiology, and Technical Services

Quality Control Report
Matrix Spike/Duplicate Report for Work Order 9410086

MS/Dupe Name	Sample Fractions Verified	Sample	Analyte	RPD	MS Recov	Cont. Limits RPD	LCL	UCL
M100694_OGS01	1-8	9410086-01	WTPH 418.1	1.3	97	26	51	122
M100694_OGS02	9-16	9410086-09	WTPH 418.1	7.0	106	26	51	122

* = Value Exceeds Control Limit
RPD = Relative Percent Difference
LCL = Lower Control Limit
UCL = Upper Control Limit
L = RPD control limit for this analyte is 5x the detection limit. The value appearing in the RPD column is the absolute difference of the duplicates.
-1 for recovery value indicates that recovery could not be calculated

An MS/Duplicate pair can validate the results for more than one work order. For this reason, results for analytes not requested on this work order may appear in this MS/Duplicate report.

Laucks Since 1908
Testing Laboratories, Inc.
940 South Harney St., Seattle, WA 98108 (206) 767-5060 FAX (206) 767-5063
Chemistry, Microbiology, and Technical Services

Quality Control Report
Duplicate Report for Work Order 9410086

Duplicate Name	Sample Fractions Verified	Sample	Analyte	RPD	Limit
D100494_TSS01	1-10	9410086-01	Total Solids	3.1	30
D100494_TSS02	11-16	9410086-11	Total Solids	0.32	30

* = Value Exceeds Control Limit
RPD = Relative Percent Difference
L = RPD control limit for this analyte is 5x the detection limit. The value appearing in the RPD column is the absolute difference of the duplicates.
-1 for recovery value indicates that recovery could not be calculated

A duplicate pair can validate the results for more than one work order. For this reason, results for analytes not requested on this work order may appear in this duplicate report.

Laucks Since 1908
Testing Laboratories, Inc.
940 South Harney St., Seattle, WA 98108 (206) 767-5060 FAX (206) 767-5063
Chemistry, Microbiology, and Technical Services

APPENDIX C

Chain-of-Custody

CHAIN OF CUSTODY RECORD

WORK ORDER ID# 9410086 PAGE 1 OF 2

DATE 10/1/94

LAUCKS Testing Laboratories, Inc.

SUBMITTED AT:
- [x] 940 South Harney St., Seattle, WA 98108 (206) 767-5060 FAX 767-5063
- [ ] 1106 Ledwich Ave., Yakima, WA 98902 (509) 248-4695 FAX 452-1265

THIS INFORMATION WILL BE USED FOR REPORTING/BILLING* (SEE BELOW)

NAME: Hart Crowser

ADDRESS:

ATTENTION:

PROJECT NAME: POTLATCH - Avery Landing

PROJECT CONTACT: BARRY KELLEMS

TELEPHONE/FAX: 324-9530 / 328-5581

JOB/P.O. NO.: J-2296-05

SAMPLER (SIGNATURE): James Hest (PRINTED NAME): JAMES HEST

LAB SA#	SAMPLE ID / LOCATION	DATE	TIME	TPH (418.1)	NO. OF CONTAINERS	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
	SP-1	9/30		X	15	SOIL SAMPLE WITH HIGHEST TPH CONCENTRATIONS SHALL BE ANALYZED FOR: • SW 8270 (Sem.-Vol.) • SW 8080 (PCBs Only) • Total RCRA Metals
	SP-2			X		
	SP-3			X		
	SP-4			X		
	SP-5			X		
	SP-6			X		
	SP-7			X		
	SP-8			X		
	SP-9			X		
	SP-10			X		
	SP-11			X		
	SP-12			X		
	SP-13			X		
	SP-14			X		
	SP-15			X		

INSTRUCTIONS

1. USE ONE LINE PER SAMPLE.
2. BE SPECIFIC IN TEST REQUESTS.
3. CHECK OFF TESTS TO BE PERFORMED FOR EACH SAMPLE.

***BILLING INFORMATION, IF DIFFERENT THAN ABOVE**

NAME ADDRESS

ATTN: CITY, STATE, ZIP

TURNAROUND REQUEST

- [ ] 24-48 HRS (100% SUR)
- [ ] 5-DAYS (50% SUR)
- [x] STD. 10-14 DAYS
- [ ] OTHER _____

15 TOTAL NO. OF CONTAINERS

CHAIN OF CUSTODY SEALS?
- [ ] YES [ ] NO [ ] NA

SHIPPED VIA:
- [ ] UPS [ ] FED-EX [ ] BUS
- [x] HAND [ ] _____

TEMPERATURE _____
- [ ] AMBIENT [ ] REPRESENTATIVE

RELINQUISHED BY (SIGN AND PRINT)	DATE / TIME	RECEIVED BY (SIGN AND PRINT)	DATE / TIME
Jim Felder	0843 10-3-94	Tracie Griggs Tracie Griggs	8:45 10-3-94
		LAUCKS TESTING LABS	

CHAIN OF CUSTODY RECORD

WORK ORDER ID# 9410086 PAGE 2 OF 2

DATE 10/1/94

Laucks Testing Laboratories, Inc.

SUBMITTED AT: ☒ 940 South Harney St., Seattle, WA 98108 (206) 767-5060 FAX 767-5063
☐ 1106 Ledwich Ave., Yakima, WA 98902 (509) 248-4695 FAX 452-1265

THIS INFORMATION WILL BE USED FOR REPORTING/BILLING* (SEE BELOW)

NAME: Hart Crowser

ADDRESS:

ATTENTION:

PROJECT NAME: POTLATCH - Avery Landing.

PROJECT CONTACT: BARRY KELLEMS

TELEPHONE/FAX: 324-9530 / 328-5581

JOB/P.O. NO.: J-2296-05

SAMPLER (SIGNATURE): James Hest (PRINTED NAME): JAMES HEST

LAB SA#	SAMPLE ID / LOCATION	DATE	TIME	TESTS TO PERFORM: TPH (418.1)	NO. OF CONTAINERS	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
	SP-16	9/30		X	1	
						SEE PAGE 1

INSTRUCTIONS

1. USE ONE LINE PER SAMPLE.
2. BE SPECIFIC IN TEST REQUESTS.
3. CHECK OFF TESTS TO BE PERFORMED FOR EACH SAMPLE.

***BILLING INFORMATION, IF DIFFERENT THAN ABOVE**

NAME ADDRESS

ATTN: CITY, STATE, ZIP

TURNAROUND REQUEST

- ☐ 24-48 HRS (100% SUR)
- ☐ 5-DAYS (50% SUR)
- ☒ STD. 10-14 DAYS
- ☐ OTHER _____

TOTAL NO. OF CONTAINERS 1

CHAIN OF CUSTODY SEALS?
☐ YES ☐ NO ☐ NA

SHIPPED VIA:
☐ UPS ☐ FED-EX ☐ BUS
☒ HAND ☐ _____

TEMPERATURE _____
☐ AMBIENT ☐ REPRESENTATIVE

RELINQUISHED BY (SIGN AND PRINT)	DATE / TIME	RECEIVED BY (SIGN AND PRINT)	DATE / TIME
Jim Feldet	10-3-94 0845	Trace Griggs	8:45a 10-3-94
		LAUCKS TESTING LABS	

FINAL REPORT COPY

ATTACHMENT B
CERTIFICATES OF ANALYSIS, OCTOBER 28, 1994
LAUCKS TESTING LABORATORIES, INC.

Laucks Since 1908
Testing Laboratories, Inc.
940 South Harney St., Seattle, WA 98108 (206) 767-5060 FAX (206) 767-5063
Chemistry, Microbiology, and Technical Services

Certificate of Analysis

CLIENT: Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, WA 98102

ATTN : Barry Kellems

Work Order# : 94-10-462
DATE RECEIVED : 10/03/94
DATE OF REPORT: 10/28/94
CLIENT JOB ID : Job No. J-2296-05

Work ID : Potlatch - Avery Landing
Taken By : Client
Transported by: Hand Delivered
Type : Soil

SAMPLE IDENTIFICATION:

	Sample Description	Collection Date
01	SP-13	09/30/94

ATTACHMENTS:

Following presentation of sample results, the following appendices are attached to this report:

Appendix A: Method Blank and Surrogate Recoveries Report
Appendix B: Matrix Spike/Matrix Spike Duplicate Report
Appendix C: Blank Spike Recovery Report

Unless otherwise instructed all samples will be discarded on 12/12/94

Respectfully submitted,
Laucks Testing Laboratories, Inc.

J. M. Owens

Laucks Since 1908
Testing Laboratories, Inc.
940 South Harney St., Seattle, WA 98108 (206) 767-5060 FAX (206) 767-5063
Chemistry, Microbiology, and Technical Services

USING OUR REPORTS

Laucks uses an electronic Laboratory Information Management System that produces both our reports and invoices. The following information and definitions will help you understand our reports, and we encourage you to call us if your questions are not answered here.

SAMPLE IDENTIFICATION - Sample IDs are recorded as they appear on your sample containers or chain-of-custody documents.

TEST RESULTS - Analyses that result in a single data point are shown in alphabetical order in the body of the report. Tests that yield multiple results are generally reported on separate pages, on a sample-by-sample basis.

MEASUREMENT UNITS - The reporting units are shown to the right of the analyte name. In the event that a different unit was more appropriate to a specific sample, that exception is shown immediately beneath the test result. Units commonly employed are mg/kg (solids) or mg/L (liquids), comparable to parts per million; ug/kg (solids) or ug/L (liquids), comparable to parts per billion; and percent (%).

METHODS OF ANALYSIS - The EPA or Standard Methods method number is shown in parentheses after the analyte name when field size allows; or, for analyses that yield multiple data points, in the header information on the individual report page.

ABBREVIATIONS - Several abbreviations can appear in our reports. The most commonly employed abbreviations are:

U : The analyte of interest was not detected, to the limit of detection indicated.

B : The analyte of interest was detected in the method blank associated with the sample, as well as in the sample itself. The B flag is applied without regard to the relative concentrations detected in the blank and sample.

J : The analyte of interest was detected below the routine reporting limit. This value should be regarded as an estimate.

T : The flagged values represent the SUM of two co-eluting compounds. The SUM of these two values is shown as though it were a result for each of them. The two figures should not be added together.

Laucks Since 1908
Testing Laboratories, Inc.
940 South Harney St., Seattle, WA 98108 (206) 767-5060 FAX (206) 767-5063
Chemistry, Microbiology, and Technical Services

CLIENT : Hart Crowser, Inc.

Certificate of Analysis

Work Order # 94-10-462

TESTS PERFORMED AND RESULTS:

Analyte	Units	01
Arsenic (Method 7061)	mg/kg DB	23.
Barium (Method 6010)	mg/kg DB	180.
Cadmium (Method 6010)	mg/kg DB	1. U
Chromium (Method 6010)	mg/kg DB	7.
Lead (Method 6010)	mg/kg DB	38.
Mercury (Method 7471)	mg/kg DB	0.1 U
Selenium (Method 7741)	mg/kg DB	0.6 U
Silver (Method 6010)	mg/kg DB	1. U
Total Solids	%	90.0

Laucks Since 1908
Testing Laboratories, Inc.
940 South Harney St., Seattle, WA 98108 (206) 767-5060 FAX (206) 767-5063
Chemistry, Microbiology, and Technical Services

REPORT ON SAMPLE: 9410462-01A
Client Sample ID: SP-13

Collection Date : 09/30/94
Date Received : 10/03/94

Date Extracted : 10/13/94
Date Analyzed : 10/21/94
Date Confirmed : 10/21/94

Test Code : 8080AS
Test Method : SW 8080
Extraction Method : SW 3550

Analyte	Result (ug/kg DB)		SDL (ug/kg DB)
Aroclor-1016	37	U	37
Aroclor-1221	74	U	74
Aroclor-1232	37	U	37
Aroclor-1242	37	U	37
Aroclor-1248	37	U	37
Aroclor-1254	37	U	37
Aroclor-1260	37	U	37

Surrogate recovery report for sample 9410462-01A

Surrogate	Percent Recovery	Limits: Min.	Max.
Isodrin	36	20	150
Tetrachloro-m-xylene	44	20	150
Decachlorobiphenyl	60	20	160

* = Indicates that recovery is outside control limits

Laucks Since 1908
Testing Laboratories, Inc.
940 South Harney St., Seattle, WA 98108 (206) 767-5060 FAX (206) 767-5063

Chemistry, Microbiology, and Technical Services

A BMJ

REPORT ON SAMPLE: 9410462-01A
Client Sample ID: SP-13
Collection Date : 09/30/94
Date Received : 10/03/94
Date Extracted : 10/13/94
Date Analyzed : 10/17/94

Test Code : LXTCSS
Test Method : SW8270
Extraction Method : SW3550

One is supposed to infer from this no. that the actual concentration for this constituent came in somewhere between 0 & 190

Analyte	Result (ug/kg DB)	SDL (ug/kg DB)	Analyte	Result (ug/kg DB)	SDL (ug/kg DB)
Phenol	190 U	190	3-Nitroaniline	930 U	930
Aniline	930 U	930	Acenaphthene	690	190
Bis(2-chloroethyl)ether	190 U	190	2,4-Dinitrophenol	1900 U	1900
2-Chlorophenol	190 U	190	4-Nitrophenol	1900 U	1900
1,3-Dichlorobenzene	190 U	190	Dibenzofuran	190 U	190
1,4-Dichlorobenzene	190 U	190	2,4-Dinitrotoluene	370 U	370
Benzyl alcohol	190 U	190	Diethyl phthalate	190 U	190
1,2-Dichlorobenzene	190 U	190	4-Chlorophenyl phenylether	190 U	190
2-Methylphenol	190 U	190	Fluorene	460	190
Bis(2-chloroisopropyl)ether	190 U	190	4-Nitroaniline	370 U	370
4-Methylphenol	190 U	190	4,6-Dinitro-2-methylphenol	1900 U	1900
N-Nitroso-di-n-propylamine	190 U	190	N-Nitrosodiphenylamine	190 U	190
Hexachloroethane	370 U	370	1,2-Diphenylhydrazine	370 U	370
Nitrobenzene	190 U	190	4-Bromophenyl phenylether	370 U	370
Isophorone	190 U	190	Hexachlorobenzene	370 U	370
2-Nitrophenol	370 U	370	Pentachlorophenol	1900 U	1900
2,4-Dimethylphenol	190 U	190	Phenanthrene	190 U	190
Benzoic acid	4600 U	4600	Anthracene	190 U	190
Bis(2-chloroethoxy)methane	190 U	190	Carbazole	190 U	190
2,4-Dichlorophenol	370 U	370	Di-n-butyl phthalate	190 U	190
1,2,4-Trichlorobenzene	190 U	190	Fluoranthene	980	190
Naphthalene	190 U	190	Pyrene	740	190
4-Chloroaniline	190 U	190	Benzidine	4600 U	4600
Hexachlorobutadiene	190 U	190	Butylbenzylphthalate	190 U	190
4-Chloro-3-methylphenol	370 U	370	3,3'-Dichlorobenzidine	1900 U	1900
2-Methylnaphthalene	190 U	190	Benzo(a)anthracene	300	190
Hexachlorocyclopentadiene	370 U	370	Chrysene	380	190
2,4,6-Trichlorophenol	370 U	370	Bis(2-ethylhexyl)phthalate	190 U	190
2,4,5-Trichlorophenol	370 U	370	Di-n-octyl phthalate	190 U	190
2-Chloronaphthalene	190 U	190	Benzo(b)fluoranthene	240 T	190
2-Nitroaniline	370 U	370	Benzo(k)fluoranthene	240 T	190
Dimethyl phthalate	190 U	190	Benzo(a)pyrene	130 J	190
Acenaphthylene	190 U	190	Indeno(1,2,3-cd)pyrene	74 J	190
2,6-Dinitrotoluene	370 U	370	Dibenzo(a,h)anthracene	190 U	190
			Benzo(g,h,i)perylene	74 J	190

Laucks Since 1908
Testing Laboratories, Inc.
940 South Harney St., Seattle, WA 98108 (206) 767-5060 FAX (206) 767-5063
Chemistry, Microbiology, and Technical Services

GC/MS ABN surrogate recovery report for sample 9410462-01A

Surrogate	Percent Recovery	Limits: Min.	Max.
2-Fluorophenol	71	33	115
d5-Phenol	80	45	112
d4-2-Chlorophenol ...	79	41	110
d5-Nitrobenzene	79	38	117
2-Fluorobiphenyl	88	47	124
d4-1,2-Dichlorobenzene	76	43	118
2,4,6-Tribromophenol	76	30	136
d14-p-Terphenyl	76	51	135

* = Surrogate recovery outside control limits

Laucks Since 1908
Testing Laboratories, Inc.
940 South Harney St., Seattle, WA 98108 (206) 767-5060 FAX (206) 767-5063
Chemistry, Microbiology, and Technical Services

APPENDIX A

Method Blank and Method Blank Surrogate Recoveries Report

Laucks Since 1908
Testing Laboratories, Inc.
940 South Harney St., Seattle, WA 98108 (206) 767-5060 FAX (206) 767-5063
Chemistry, Microbiology, and Technical Services

Quality Control Report
Method Blanks for Work Order 9410462

Blank Name	Samples Verified	Test Description	Result	Units	Control Limit
B101994_HY_S01	1	Arsenic by gaseous hydride AA	0.50 U	mg/kg DB	1.0
		Selenium by Gaseous Hydride AA	0.50 U		1.0
B102094_HG_S01	1	Mercury by Cold Vapor	0.10 U	mg/kg DB	0.20
B102494_ICP_S01	1	Silver by ICP	1.0 U	mg/kg DB	2.0
		Barium by ICP	2.0 U		4.0
		Cadmium by ICP	1.0 U		2.0
		Chromium by ICP	1.0 U		2.0
		Lead by ICP	10 U		20
		Arsenic by ICP	20 U		40
		Copper by ICP	1.0 U		2.0
		Nickel by ICP	2.0 U		4.0
		Zinc by ICP	1.0 U		5.0
		Selenium by ICP	20 U		40
		Molybdenum by ICP	1.0 U		2.0
		Potassium by ICP	100 U		200
B101394_GPX_S03	01	Aroclor-1016	33 U	ug/kg	33
		Aroclor-1221	67 U		67
		Aroclor-1232	33 U		33
		Aroclor-1242	33 U		33
		Aroclor-1248	33 U		33
		Aroclor-1254	33 U		33
		Aroclor-1260	33 U		33
B101394_MSV_S01	1	Phenol	33 U	ug/kg	33
		Aniline	170 U		170
		Bis(2-chloroethyl)ether	33 U		33
		2-Chlorophenol	33 U		33
		1,3-Dichlorobenzene	33 U		33
		1,4-Dichlorobenzene	33 U		33
		Benzyl Alcohol	33 U		33
		1,2-Dichlorobenzene	33 U		33

A method blank can validate more than one analyte on more than one work order. The method blanks in this report may validate analytes not determined on this work order, but nonetheless determined in the associated blank.

Because they validate more than one work order, method blank results are not always reported in the same concentration units or to the same detection limits that are used for sample results.

* = blank exceeds control limit

Laucks Since 1908
Testing Laboratories, Inc.
940 South Harney St., Seattle, WA 98108 (206) 767-5060 FAX (206) 767-5063
Chemistry, Microbiology, and Technical Services

Quality Control Report
Method Blanks for Work Order 9410462

Blank Name	Samples Verified	Test Description	Result	Units	Control Limit
		2-Methylphenol	33 U		33
		Bis(2-chloroisopropyl)ether	33 U		33
		4-Methylphenol	33 U		33
		N-Nitroso-di-n-propylamine	33 U		33
		Hexachloroethane	67 U		67
		Nitrobenzene	33 U		33
		Isophorone	33 U		33
		2-Nitrophenol	33 U		33
		2,4-Dimethylphenol	33 U		33
		Benzoic Acid	10 J		830
		Bis(2-chloroethoxy)methane	33 U		33
		2,4-Dichlorophenol	67 U		67
		1,2,4-Trichlorobenzene	33 U		33
		Naphthalene	33 U		33
		4-Chloroaniline	33 U		33
		Hexachlorobutadiene	33 U		33
		4-Chloro-3-Methylphenol	67 U		67
		2-Methylnaphthalene	33 U		33
		Hexachlorocyclopentadiene	67 U		67
		2,4,6-Trichlorophenol	67 U		67
		2,4,5-Trichlorophenol	67 U		67
		2-Chloronaphthalene	33 U		33
		2-Nitroaniline	67 U		67
		Dimethyl phthalate	33 U		170
		Acenaphthylene	33 U		33
		2,6-Dinitrotoluene	67 U		67
		3-Nitroaniline	170 U		170
		Acenaphthene	33 U		33
		2,4-Dinitrophenol	330 U		330
		4-Nitrophenol	330 U		330

A method blank can validate more than one analyte on more than one work order. The method blanks in this report may validate analytes not determined on this work order, but nonetheless determined in the associated blank.

Because they validate more than one work order, method blank results are not always reported in the same concentration units or to the same detection limits that are used for sample results.

* = blank exceeds control limit

Laucks Since 1908
Testing Laboratories, Inc.
940 South Harney St., Seattle, WA 98108 (206) 767-5060 FAX (206) 767-5063
Chemistry, Microbiology, and Technical Services

Quality Control Report
Method Blanks for Work Order 9410462

Blank Name	Samples Verified	Test Description	Result	Units	Control Limit
		Dibenzofuran	33 U		33
		2,4-Dinitrotoluene	67 U		67
		Diethyl phthalate	33 U		170
		4-Chlorophenyl phenylether	33 U		33
		Fluorene	33 U		33
		4-Nitroaniline	67 U		67
		4,6-Dinitro-2-methylphenol	330 U		330
		N-Nitrosodiphenylamine	33 U		33
		1,2-Diphenylhydrazine	67 U		67
		4-Bromophenyl phenyl ether	67 U		67
		Hexachlorobenzene	67 U		67
		Pentachlorophenol	330 U		330
		Phenanthrene	33 U		33
		Anthracene	33 U		33
		Di-n-butyl phthalate	33 U		1700
		Fluoranthene	33 U		33
		Pyrene	33 U		33
		Benzidine	830 U		830
		Butylbenzylphthalate	33 U		170
		3,3'-Dichlorobenzidine	330 U		330
		Benzo(a)anthracene	33 U		33
		Chrysene	33 U		33
		Bis(2-ethylhexyl) phthalate	97		1700
		Di-n-octyl phthalate	33 U		170
		Benzo(b)fluoranthene	33 U		33
		Benzo(k)fluoranthene	33 U		33
		Benzo(a)pyrene	33 U		33
		Indeno(1,2,3-cd)pyrene	33 U		33
		Dibenzo(a,h)anthracene	33 U		33
		Benzo(g,h,i)perylene	33 U		33

A method blank can validate more than one analyte on more than one work order. The method blanks in this report may validate analytes not determined on this work order, but nonetheless determined in the associated blank.

Because they validate more than one work order, method blank results are not always reported in the same concentration units or to the same detection limits that are used for sample results.

* = blank exceeds control limit

Laucks Since 1908
Testing Laboratories, Inc.
940 South Harney St., Seattle, WA 98108 (206) 767-5060 FAX (206) 767-5063
Chemistry, Microbiology, and Technical Services

Quality Control Report
Method Blanks for Work Order 9410462

Blank Name	Samples Verified	Test Description	Result	Units	Control Limit
		Carbazole	33 U		33

A method blank can validate more than one analyte on more than one work order. The method blanks in this report may validate analytes not determined on this work order, but nonetheless determined in the associated blank.

Because they validate more than one work order, method blank results are not always reported in the same concentration units or to the same detection limits that are used for sample results.

* = blank exceeds control limit

Laucks Since 1908
Testing Laboratories, Inc.
940 South Harney St., Seattle, WA 98108 (206) 767-5060 FAX (206) 767-5063
Chemistry, Microbiology, and Technical Services

Quality Control Report
Multi-Component Method Blanks
Surrogate Recoveries for Work Order 9410462

Blank Name	Test Description	Surrogate Compound	Recov	LCL	UCL
B101394_GPX_S03	Organochlorine PCBs in Soil	Isodrin	73	20	150
		Tetrachloro-m-xylene	70	20	150
		Decachlorobiphenyl	94	20	160
B101394_MSV_S01	GC/MS ABNs, LTL surrogate limits	2-Fluorophenol	69	33	115
		d5-Phenol	73	45	112
		d4-2-Chlorophenol	72	41	110
		d5-Nitrobenzene	71	38	117
		2-Fluorobiphenyl	72	47	124
		d4-1,2-Dichlorobenzene	72	43	118
		2,4,6-Tribromophenol	73	30	136
		d14-p-Terphenyl	82	51	135

* = Recovery exceeds control limit

Recov = Percent recovery of surrogate compound
LCL = Lower Control Limit
UCL = Upper Control Limit

Laucks Since 1908
Testing Laboratories, Inc.
940 South Harney St., Seattle, WA 98108 (206) 767-5060 FAX (206) 767-5063
Chemistry, Microbiology, and Technical Services

APPENDIX B

Matrix Spike/Matrix Spike Duplicate Report

Laucks Since 1908
Testing Laboratories, Inc.
940 South Harney St., Seattle, WA 98108 (206) 767-5060 FAX (206) 767-5063
Chemistry, Microbiology, and Technical Services

Quality Control Report
MS/MSD Report for Work Order 9410462

MS/MSD Name	Sample Fractions Verified	MS/MSD Sample	Analyte	Percent Recovery MS	MSD	RPD	Cont. Limits LCL	UCL	RPD
K100794_MSVS01	1	9410202-01	Phenol	57	58	3	41	109	28
			2-Chlorophenol	69	69	1	40	106	30
			1,4-Dichlorobenzene	69	63	9	34	107	36
			N-Nitroso-di-n-propylamine	78	80	3	48	118	28
			1,2,4-Trichlorobenzene	72	78	7	40	121	30
			4-Chloro-3-methylphenol	73	88	18	55	120	22
			Acenaphthene	70	76	8	41	122	42
			4-Nitrophenol	72	82	13	23	143	37
			2,4-Dinitrotoluene	74	85	15	32	127	25
			Pentachlorophenol	72	79	9	20	159	43
			Pyrene	88	98	11	25	141	50
K101294_GPXS04	01	9410382-05	Aroclor 1260	87	90	3	20	160	50
K101994_HYS01	1	9410462-01	Arsenic	102	110	7	60	128	30
			Selenium	71	86	18	50	148	30
K102094_HGS01	1	9410476-01	Mercury	65	68	5	65	130	30
K102494_ICPS01	1	9410462-01	Silver	92	86	6	58	132	30
			Arsenic	112	109	3	70	127	30
			Barium	110	95	15	61	127	20
			Cadmium	102	98	4	60	138	21
			Chromium	90	85	6	60	134	30
			Copper	116	122	5	50	150	30
			Nickel	98	94	3	69	124	21
			Lead	113	113	0	50	148	30
			Selenium	106	103	3	67	129	10

* = Value Exceeds Control Limit
RPD = Relative Percent Difference
LCL = Lower Control Limit
UCL = Upper Control Limit
-1 for recovery value indicates that recovery could not be calculated

An MS/MSD pair can validate the results for more than one work order. For this reason, results for analytes not requested on this work order may appear in this MS/MSD report.

Laucks Since 1908
Testing Laboratories, Inc.
940 South Harney St., Seattle, WA 98108 (206) 767-5060 FAX (206) 767-5063
Chemistry, Microbiology, and Technical Services

Quality Control Report
MS/MSD Report for Work Order 9410462

MS/MSD Name	Sample Fractions Verified	MS/MSD Sample	Analyte	Percent Recovery MS	MSD	RPD	Cont. Limits LCL	UCL	RPD
			Zinc	110	128	15	50	150	30
			Molybdenum	104	103	1	50	150	30

* = Value Exceeds Control Limit
RPD = Relative Percent Difference
LCL = Lower Control Limit
UCL = Upper Control Limit
-1 for recovery value indicates that recovery could not be calculated

An MS/MSD pair can validate the results for more than one work order. For this reason, results for analytes not requested on this work order may appear in this MS/MSD report.

Laucks Since 1908
Testing Laboratories, Inc.
940 South Harney St., Seattle, WA 98108 (206) 767-5060 FAX (206) 767-5063
Chemistry, Microbiology, and Technical Services

APPENDIX C

Blank Spike Recovery Report

Laucks Since 1908
Testing Laboratories, Inc.
940 South Harney St., Seattle, WA 98108 (206) 767-5060 FAX (206) 767-5063
Chemistry, Microbiology, and Technical Services

Quality Control Report
Blank Spike Report for Work Order 9410462

Blank Spike Names						
Database	Lab Assigned	Fractions Verified	Analyte Name	Recov	LCL	UCL
S101394_GPXS03	S1013GPXSLC	01	Aroclor 1260	94	20	160
S101994_HYS01	BS1019FAS01	1	Arsenic	93	60	128
			Selenium	100	50	148
S102494_ICPS01	BS1024ICPS01	1	Arsenic	108	70	127
			Barium	106	61	127
			Cadmium	100	60	138
			Chromium	86	60	134
			Copper	108	50	150
			Lead	107	50	148
			Molybdenum	106	50	150
			Nickel	102	69	124
			Selenium	107	67	129
			Silver	98	58	132
			Zinc	104	50	150

* = Value Exceeds Control Limit
LCL = Lower Control Limit
UCL = Upper Control Limit

A blank spike can validate the results for more than one work order. For this reason, results for analytes not requested on this work order may appear in this blank spike report.